

RARE Project – Heavy-Duty Diesel Truck Activity Factors Analysis

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Research Goals:

- Advance the state-of-the-science vis-à-vis the improvement of heavy-duty diesel emission factors, activity rate data, and emissions modeling;
- Develop a tool that would allow Region 4 to assess control strategies vis-à-vis heavy-duty truck emissions.

Funding: 2-Year Project, \$200,000

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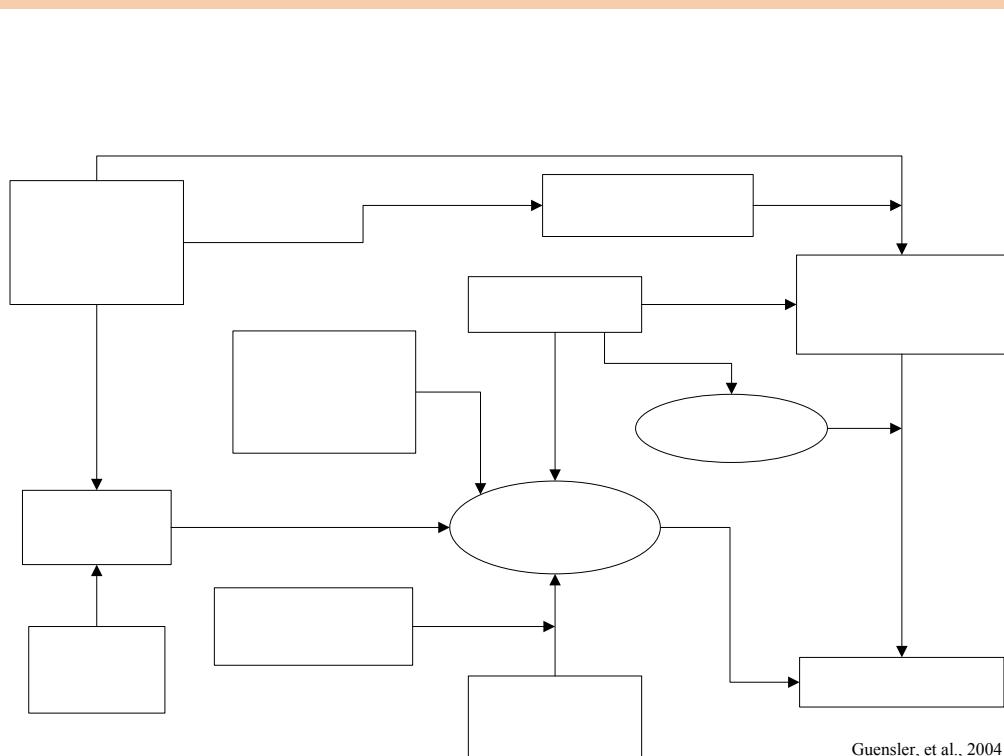
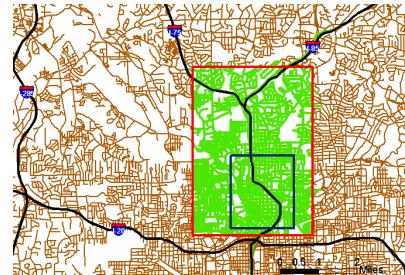
Impacts/Outcomes

- Improved emission factor and activity rate data would be incorporated into improved modeling tools that would enable emission inventory and air quality modelers to develop and implement more effective HDV emission reduction strategies.
- Influence improvements to MOBILE (current mobile source emission factor model) and design of MOVES – successor to MOBILE.

Project Progress

- 1st Year Project Activities – Completed
 - ✓ Developed Algorithms/Equations
 - ✓ Developed Model Framework – GIS Environment
 - ✓ Implemented and Demonstrated Model
- 2nd Year Activities – In Progress
 - ✓ Model Validation
 - ✓ Report on Strengths/Weaknesses of Model
 - ✓ Develop Sensitivity Analysis Report

The heavy-duty diesel vehicle modal emissions model (HDDV-MEM) was run for a portion of the Atlanta downtown area along I-75/I-85 downtown connector. The image below shows the selected roadway links (green links in the red rectangle) inside I-285 circle and links in the middle of downtown (green links in the blue rectangle).



Guensler, et al., 2004

Example Model Results

Four one-hour scenarios (7 a.m., 12 p.m., 5 p.m., and 10 p.m.) were run for a typical summer day in the case study area using the HDDV-MEM. Hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) emissions estimated using HDDV-MEM were compared with estimates derived using MOBILE6.2. MOBILE6.2 was run with Atlanta 13-county planning area default input parameters with hourly database output options. Because the HDDV-MEM does not yet account the off-cycle NOx effect, the “No Defeat Device” option was used for MOBILE6.2 runs.

As shown in Figures 1 and 2, roadway links on the I-75/I-85 downtown connector show higher NOx emission rates than other arterials or local roads. These higher emission rates resulted from roadway links in the downtown Atlanta area have much higher HDDV volumes than other roadway links throughout the same time periods.



Figure 1 Selected Links Inside I-285



Figure 2. Selected Links In Downtown Atlanta

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